

Appendix A - Example of Prepublished Content Product Entity Structure Part

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 !Contrib_Last_Name:Schiavone
 !Contrib_Affiliation:University of Alberta
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CHAPTER.C:0130808598.02.00.00

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!Title:Studying Engineering: The Keys to Success

!Authored_Abstract:What does it take to be successful in engineering? The good news is that we know the answer to this question: Thousands of engineering students have been doing it for years. As a freshman engineering student, your biggest advantage lies in the fact that many people have already done what you have decided to do, namely, graduate in engineering. To find out what you need to do, you need only draw from the experiences of the many successful engineering students that have gone before you. That is what this chapter (and most of this book) is about: the tried and tested techniques that will guarantee you success in engineering study.

!Authored_Abstract:The most successful engineering students exhibit common key characteristics in their approach to engineering study. The following table lists those characteristics, along with actions typically associated with each: Characteristic Actions Commitment Decide to be successful. Set appropriate goals. Stay focused. Stay determined to succeed. Continually remind yourself of the reasons you chose engineering. Application Apply yourself fully to attain your goals. Work hard. Strategy Work smart. Maximize effectiveness. Learn the rules and play the game. Perseverance Don't give up after the first, second, or third try. Keep going. Stay focused on your goals. Use power thinking! Associations Associate with people that maintain a positive attitude, people that will help you attain your goals. Avoid underachievers and those who do not share your objectives.

!Authored_Abstract:In the sections that follow, we discuss each of the preceding characteristics and how they will guide you to success as an engineering student.

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CHAPTER.C:0130808598.04.00.00

!SKU:0000000014625

!Title:The Role of the University

!Authored_Abstract:Universities and colleges have always played a pivotal role in training engineers. In addition to providing the environments and opportunities necessary for learning, they continually collaborate with professional engineering organizations and engineering accreditation boards to develop engineering programs that are up to date and compatible with the ever-changing needs of modern society.

!Authored_Abstract:Your decision to pursue an engineering education has committed you to spending the next four or five years learning (or training) in a university environment. Consequently, you must learn how to be most effective as an engineering student. The first step in doing so is to understand as much as possible about your learning environment, namely, its basic structure and how it works. This will ensure that you derive maximum benefit from each of the resources and facilities available as part of your engineering program.

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CHAPTER.C:0130808598.05.00.00

!SKU:0000000014632

!Title:Learning in the University Environment

!Authored_Abstract:High schools and universities offer vastly different educational environments in terms of the way in which knowledge is delivered and the amount of independent learning that is expected. In high school, there is very little need to find things out for yourself. Teachers tell you everything you need to know to solve your problems. You learn by absorbing this information and repeating it on homework assignments and examinations.

!Authored_Abstract:At a university, your role in the learning process is much more significant. There is no longer one central source of wisdom. Instead, information has to be sought out, often from many different sources. In addition, you may have to deal with the usual imperfections in the system, such as poorly prepared and delivered lectures, confusing and uncooperative instructors, and unreadable textbooks. This means that you have to take the initiative and find out for yourself what you need to know. In other words, you are expected to

!Authored_Abstract:Take responsibility for your own learning!

!Authored_Abstract:This is the fundamental assumption on which the postsecondary education system is based, and until you realize it, you cannot maximize your performance in engineering study.

!Authored_Abstract:Most engineers are forced to become more independent in their learning after they graduate, usually on their first job, when they are faced with a collection of real-world problems, most of which are poorly defined and without any known solution. This time there are no professors to ask and no lectures or textbooks that will reveal the answer, so they learn to find the necessary information themselves. In effect they acquire the skills of thinking independently and learning independently, two of the most important skills an engineer can possess.

!Authored_Abstract:Wouldn't it be great if you could learn these skills immediately so that you can put them to use right now? This chapter will help you do just that. It will provide you with training in independent learning ahead of time, at the very beginning of your university education. This will serve not only to prepare you for life after graduation, but also to ensure that you perform at the highest level throughout your engineering education.

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CHAPTER.C:0130808598.06.00.00

!SKU:0000000014649

!Title:Key Strategies for Maximizing Performance in Engineering Courses

!Authored_Abstract:Over the last 10 years, I have taught many different engineering courses at various levels, from an introductory level to a more advanced graduate level. At the end of each course, I approach the most successful students and ask them to describe their study or work habits and any special techniques they may have used to achieve that particular level of success. Year after year, the same answers keep coming back. These answers indicate clearly that the most successful engineering students practice, in common, a set of key study strategies specific to engineering courses. Perhaps even more significant is the fact that almost every one of these strategies is absent from the study habits of the less successful students. This is no surprise: These same skills used to be taught as part of any basic high school curriculum. Recently, however, weaknesses in the secondary education system have meant that most freshman engineering students arrive without these skills, and very few of them take the time to acquire them for themselves. As a result, many new engineering students find it difficult to make the transition between high school and college. This almost always leads to poor performance in the first year.

!Authored_Abstract:In this chapter, we address the issue of performance and present that very collection of study strategies used by the most successful engineering students. The strategies themselves are sufficiently general to be applicable to all engineering courses at any level. In particular, we discuss:Time management strategies.Preparing for an engineering course and making sure that your

prerequisite works.Effective note taking.Making effective use of the course textbook.How to be effective on assignments.Using posted solutions to assignments.Using tutors and study guides.

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CHAPTER.C:0130808598.07.00.00

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!Title:How to Be Successful on Examinations

!Authored_Abstract:Examinations invariably make up the single largest contribution to your final grade in any engineering course.

!Authored_Abstract:This simple fact explains why many engineering students are focused on examinations (quizzes, midterms, and finals), rather than on an appreciation of the course material. Like it or not, your performance on examinations will more or less determine how well you do in your engineering courses. For this reason, it is essential to understand why the very best engineering students are so successful in examinations and to learn how to use this information to your advantage.

!Authored_Abstract:So why do certain students perform so much better than others on examinations? Some students put it down to a simple matter of intelligence: "Oh, that girl is really smart. Her father is a physics teacher and her mother has a Ph.D. No wonder she scores over 90 percent on all her tests." Others put it down to the lack of a social life: "That guy never goes out. He


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CHAPTER.C:0130808598.08.00.00

!SKU:0000000014663

!Title:Procedures for Effective Problem Solving

!Authored_Abstract:We have already noted that examples and practice problems are essential components of maximizing one's performance in any engineering course. Consequently, a significant amount of course time (lectures, tutorials, labs, and assignments) is devoted to worked-out examples and relevant practice problems.5 and , we emphasized the importance of presentation in developing effective problem-solving techniques-in other words, how an effective solution requires that you demonstrate a clear, logical, and organized procedure.--> In this chapter, we examine actual problem-solving strategies. We illustrate our ideas with worked-out examples from different engineering courses.

!Authored_Abstract:Basically, two types of problems are encountered in engineering courses:

!Authored_Abstract:Type AThose that require mainly the application of known techniques and minimal thinking. In other words, these problems require you to repeat from memory, know the meanings of certain key concepts, and apply established course material to new situations. Such problems are also known as plug-and-chug problems, solved by applying a formula or set procedure. This type of problem is

common in introductory mathematics courses, such as beginning calculus, where you are often asked to use set procedures to, for example, differentiate . . . , integrate . . . , solve . . . , and so on.

!Authored_Abstract:Type B Those that require mainly thinking and minimal application of established techniques. These problems exercise the higher level thinking skills and, as such, are often more difficult than Type A problems. They usually involve some mathematical modeling, followed by the evaluation and application of selected mathematical techniques (usually from the course material) and, finally, the interpretation of results in the context of the physical problem. Type B problems include those commonly referred to as word problems and are usually found in courses such as engineering mechanics and physics, where real physical situations must first be translated into mathematical language before known procedures can be applied.

!Authored_Abstract: In the sections that follow, we examine procedures used to solve each type of problem.

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CHAPTER.C:0130808598.09.00.00

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CHAPTER.C:0130808598.10.00.00

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!Title:Developing Engineering Skills

!Authored_Abstract:Excellent technical engineering skills are, in themselves, not sufficient to guarantee a successful career in engineering. The following is a list of skills that employers are constantly demanding. The ability to communicate effectively, including- The ability to write clear, coherent technical documents.- The ability to present well-researched, well-organized seminars confidently and competently. The ability to work effectively in teams with people from different backgrounds. The ability to demonstrate creativity in all aspects of the profession. The ability to manage personnel and resources in engineering projects. The ability to keep up to date with developments during one's years as a professional engineer.

!Authored_Abstract:These skills are highly prized by employers. Acquiring such skills will not only give you the edge in employability, but also allow you to go well beyond your training as an engineer towards an ever-expanding number of exciting and challenging opportunities.

!Authored_Abstract:What can you do to give yourself a head start and acquire the foregoing skills before you graduate? We have already discussed how teamwork and independent learning skills Chapter 4) --> can contribute to success in engineering study. Practicing these skills as an undergraduate engineering student is an excellent way to equip yourself beforehand with at least three of them: The ability to work effectively in teams with people from different backgrounds. Your experience with teamwork as an undergraduate engineering student will make this skill second nature to you by the time you graduate. Not only will you know how to work as part of a team, but you will have the ability to organize and manage teams. The ability to keep up to date with developments in engineering. As an engineering student, you become well accustomed to learning and thinking independently. The ability to keep up to date with developments in engineering requires that you find and assimilate information independently, as required. This is exactly what you do as a resourceful, committed undergraduate engineering student. The ability to manage personnel and resources in engineering projects. Practicing teamwork and independent learning together means that you learn to manage not only your own resources (time, energy, money, etc.), but also the resources of those around you. You learn how to find information effectively, how to use that information to attain a defined goal, and how to communicate the information to other group members.

!Authored_Abstract:In this chapter, we concern ourselves with the remaining two engineering skills: The ability to communicate effectively, including The ability to write clear, coherent technical documents. The ability to present well-researched, well-organized seminars confidently and competently. The ability to demonstrate creativity in all aspects of the profession.

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CHAPTER.C:0130808598.11.00.00

!SKU:0000000014694

!Title:Looking to the Future: What's after Graduation?

!Authored_Abstract:Our discussion so far has been concerned with maximizing performance in engineering study. The ultimate goal has been the successful completion of your undergraduate degree in engineering, the foundation of your engineering education. Upon completing your degree, you will have a variety of options for what to do next. Basically, the choice comes down to one of the following two possibilities:

!Authored_Abstract:Go to work as a practicing engineer. Continue your study towards a graduate degree.

!Authored_Abstract:In this chapter, we will take a brief look at both options.

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